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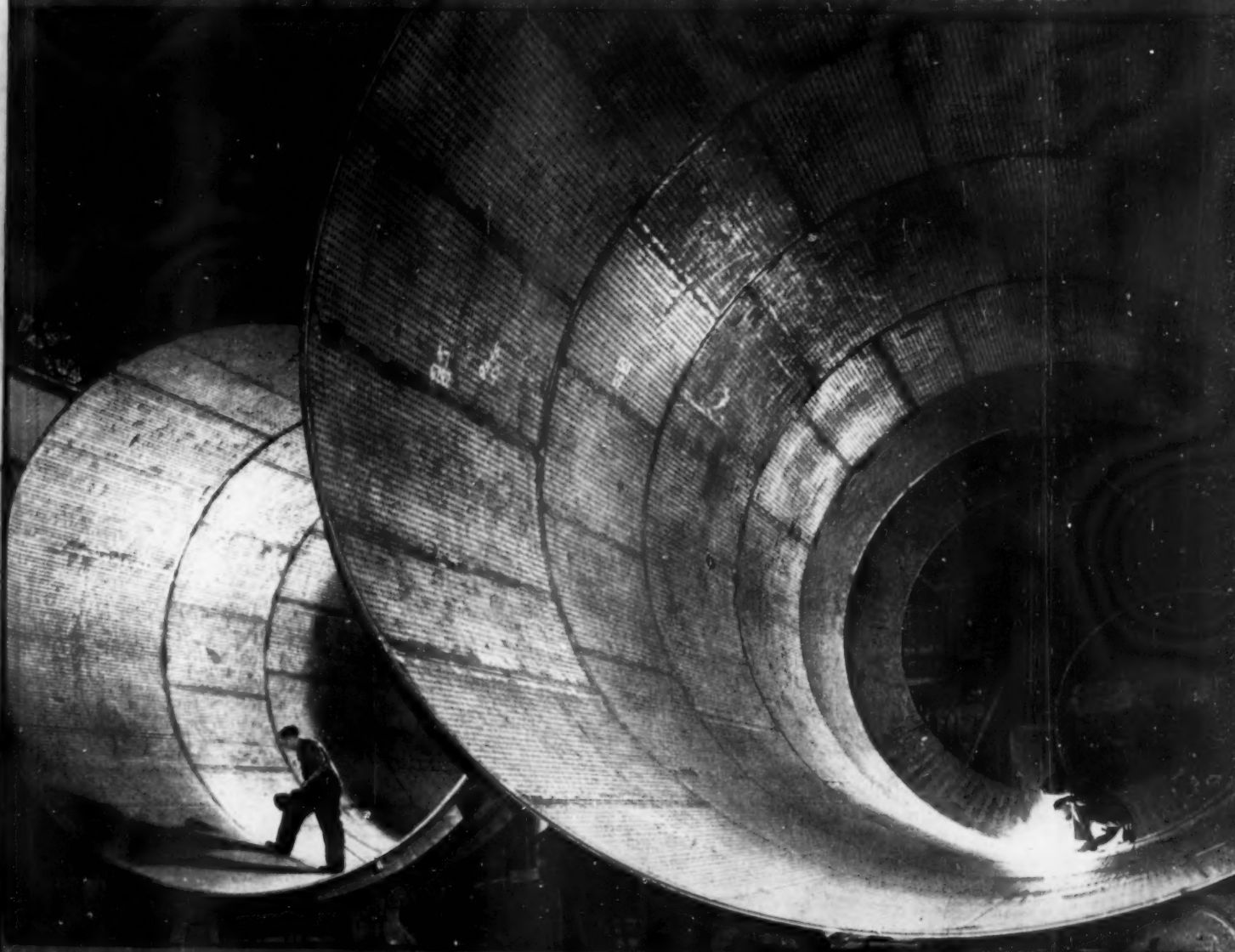
JUNE 18, 1949

SCIENCE NEWS LETTER

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JUN 20 1949

THE WEEKLY SUMMARY OF CURRENT SCIENCE



Stainless

See Page 394

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MEDICINE

Glass Cloth Stops Rays

Clothing made of lead fiberglas may protect relief workers after an atom bomb burst in event of another war. It will also protect doctors using X-rays.

► GLASS CLOTHING will allow rescue workers in the next war to rush into the "hot areas" after an atomic bomb burst, thanks to successful efforts of five Virginia doctors to protect X-ray workers from the radiation that causes deadly leukemia.

Shown to the American Medical Association in Atlantic City for the first time, the fibers of glass, heavy with protective lead, stop the "bullets" of dangerous radiation from atomic bomb debris.

Doctors using X-rays to find and destroy cancers that threaten their patients' lives will themselves be saved from death by leukemia. This deadly disease, which has been likened to a cancer of the blood, is now killing X-ray specialists at eight times the rate it kills other doctors.

This death toll among his colleagues led Dr. Vincent W. Archer of the University of Virginia to a search for better protection than is given by the lead-impregnated rubber aprons now used for this purpose.

The heavy, silky material made of lead fiberglas by Owens-Corning Fiberglas Company is the answer. For X-ray workers, this material forms the sleeves and front of a white apron-coat. Part of the apron is made of three- to five-ply weave of the material, to give extra protection to the arms and abdomen. These regions, Dr. Archer's tests showed, get more radiation than other parts of the body as the X-ray doctor works.

The new apron, in a medium size to fit the average man, weighs nine pounds, twelve ounces, which is only two ounces more than the less protective lead rubber

aprons now used. Cost of the first hundred pounds of the material, enough to make four aprons, was \$5,000. But this high cost included all the initial expenses of setting up a new pilot plant for production of the lead fiberglas. When made on a large scale, the material probably will not cost more than \$15 or \$20 per apron.

Large scale production has not started and the material is not now available, Dr. Archer told doctors whose first question was, "Where can we get them?"

The fibers of lead glass will not be made into protective clothing for wear in event of an atom bomb burst because it will not give protection against the intense, immediate radiation from the bomb itself. Only many feet of concrete or heavy thicknesses of metal such as lead, will protect against that. But the material will protect against the radiation coming off from contaminated material and debris from the bomb after the burst. It is this factor that makes it valuable for rescue workers going into areas immediately after the burst.

The material is flexible, like any heavy fabric. It is strong, resistant to chemicals, does not deteriorate in storage, is fireproof, nonshrinking and will not cause allergies in wearers.

Dr. Archer was assisted in development of this new protective fabric by Drs. George Cooper, Jr., Herbert D. Hebel, and John G. Kroll of the University of Virginia Hospital and Dr. Christian V. Cimmino of Fredericksburg, Va.

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MEDICINE

Technique for Leukemia

► A HOPEFUL advance in leukemia fighting was announced at the meeting of the American Medical Association in Atlantic City. It consists of a precision technique for treatment that would be lost if doctors had to continue the trial and error methods of the past.

A young man who about a year ago was given three days to live is now back at his work as college athletic director, thanks to the new precision technique for treatment. His case and others also as dramatic were reported by Drs. Charles A. Doan, B. K. Wiseman and Claude-Starr Wright of Ohio State University College of Medicine.

He is alive because the Ohio doctors

have found that each of three modern chemicals used to treat leukemia works best in one kind of leukemia, but the one that is good medicine in one type of the disease is not good in another. Aminopterin, an anti-vitamin chemical, for example, is effective in lymphocytic leukemia and a little effective in monocytic leukemia. But it does not help patients with myeloid leukemia. That kind is helped by urethane, a chemical that is not effective in other leukemias. And nitrogen mustard, the war gas chemical, is good in monocytic leukemia, a little effective in the myeloid type and ineffective in the lymphocytic leukemia.

A patient coming to the hospital with acute leukemia is just as sick and in just

as great danger as a patient with acute appendicitis, Dr. Doan emphasized. Vital time may be lost if the doctor has to try first one treatment and then another in the hope of hitting one that is effective. But study of a patient's blood cells and bone marrow will tell which type of leukemia he has and, therefore, which type of treatment will be most effective.

Diet treatment is also prescribed by the Ohio doctors for some leukemia patients on the basis of the kind of leukemia they have. In one kind, the study of the blood cells shows that an enzyme chemical needed to handle fat is missing or ineffective. Such patients get a diet that completely eliminates fat. Another kind are limited to less than two ounces of protein food a day because they lack a protein digesting enzyme.

The techniques the Ohio doctors have worked out resulted from the study of over 1,000 leukemia patients during the last 18 years.

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METEOROLOGY-BOTANY

Complete Weather Control Obtained for Plant Studies

► ALL TYPES of climatic conditions from hot to cold and dry to wet can be reproduced in a new plant research laboratory dedicated in Pasadena, Calif. It is claimed to be the first in the world designed and built so as to obtain complete weather control.

It is the Earhart Plant Research Laboratory of the California Institute of Technology, constructed with a donation from the Earhart Foundation of Ann Arbor, Mich. In it can be duplicated arctic or tropical weather, cold nights and hot days, or vice versa, humid or dry weather, rain storms of varying intensities, and wind storms up to 20 miles an hour.

Out of the research to be conducted under these various climatic conditions, according to Dr. Fritz Went who will be in charge, scientists will obtain new knowledge of the conditions under which specific plants can be expected to produce good crops, or poor ones.

In the laboratory are six air-conditioned greenhouses in which natural daylight is the light source. There are 13 equipped with huge batteries of fluorescent lamps as an artificial light source. In addition there are 11 darkrooms and nine other greenhouses, the latter to be kept at constant temperatures and humidity.

An intricate control board at which workers can control the climate in any individual laboratory is provided. By opening and closing valves and throwing electrical switches, the conditions of a room can be changed from equatorial to polar. Other controls can produce a pea soup California fog, a hot desert wind, a cloud-burst or a lazy drizzle of rain.

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MEDICINE

Influencing Sex of Baby

Experiments suggest that boys are conceived toward the end of the woman's fertile period of the month. Rat-breeding experiments pointed to this.

► PARENTS who want the next baby to be a boy might try timing the conception date as late as possible in the wife's most fertile period of the month. Scientists cannot guarantee that this will succeed, but a report to the American Medical Association in Atlantic City seems now to point that way.

In experimental breeding of rats, the later in the fertile period the animals were mated, the greater was the number of male offspring, Drs. Deryl Hart and James D. Moody of Duke University reported. The percentage of male to female offspring was increased from a normal of 100 to percentages varying from 149 to 225. Because rats would not mate early when the female was in heat, it was not possible to vary the percentage to a female preponderance.

Hamsters, the Duke doctors found, were more obliging. But their time-sex ratio was just the reverse of that in rats. There were more male offspring when the animals were mated early and more females when

they were mated late.

The doctors think the human schedule will be like the rat schedule, though they have very little factual basis for this as yet. Actually it will be several years before they have enough evidence from human cases to be sure.

From U. S. vital statistics records of twins and triplets born in 1941, 1942 and 1945 comes some evidence that they are right in thinking that factors at different points in the fertility period predispose to one or the other sex. Among two-egged twins, they found, there is a constant ratio of 126 to 127 like-sexed twins, that is both twins boys or both girls, to 100 where one twin was a boy and the other a girl. This is more than could happen by chance alone. If, as they think, the time of conception determines sex, then it would be likely that both twins conceived at the same time would have the same sex. Twins conceived in the middle of the fertile period would, according to the theory, be of opposite sex.

If it were only a matter of chance, then all two-egged twins would be divided evenly among boys and girls. This, the vital statistics records showed, was not the case.

Science News Letter, June 18, 1949

INVENTION

Solid Top for Convertibles Patented

► A CONVERTIBLE car with a solid top, instead of the fabric-over-hoops variety, has been invented by George E. Shilala, of Los Angeles.

The top, which may be of metal, laminated wood or plastic, swings back into the rear compartment when not in use. A reversible electric motor, powered from the battery, raises and lowers it. Weather-tight stripping prevents entry of rain at its lines of contact with the windshield and other parts of the body.

U. S. patent 2,471,378 has just been granted on this invention.

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MEDICINE

New X-Ray Machine Helps Spot Defects in Children

► CHILDREN born with defective hearts will be helped by a technique for taking rapidly a continuous series of X-ray pictures of the heart and blood vessels.

By adapting the magazine of an aerial camera to an X-ray photographing apparatus, the taking of a continuous roll of X-ray films was made possible, Drs. Wendell G. Scott and Sherwood Moore of the Washington University School of Medicine in St. Louis, explained to the American Medical Association in Atlantic City.

This development will be a special boon to children because at least two per cent are born with some type of malformed heart. It had previously been very difficult to keep them still or make them stop breathing when X-ray exposures were made to diagnose their condition.

First an opaque chemical is injected into the vein of the arm. As this chemical travels through the heart and lungs rapid X-ray shots at the rate of one every half second are taken. These pictures will show the doctor the size and location of an abnormality in the walls of the heart chamber or in the arteries leading to and from the heart. The machine works automatically.

To keep the children quiet during this procedure the doctors gave infants a little sugar water in a bottle and older children were given phenobarbital.

Drs. Scott and Moore predicted that it would be possible to operate on the inner sections of the heart sometime in the 1950's, basing their conclusion on the great strides made in surgery of the chest.

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NEW X-RAY PHOTOGRAPHING MACHINE—An opaque chemical is injected into the arm of this child so that a series of rapid, continuous X-ray pictures can be taken to follow the course of the chemical through the heart and lungs. This will show doctors where a defect in the blood vessel is located.

MEDICINE

Pentothal Aids Alcoholics

► A SUCCESSFUL method of weaning patients away from alcohol who have been driven to drink by emotional or nervous tension was reported by Drs. Frederick Lemere and Paul O'Hollaren of the Shadel Sanitarium for the Treatment of Alcoholism, Seattle, Wash., to the American Medical Association.

With the aid of pentothal, a hypnotic drug, the patient is questioned about the past to find out what caused him to take up drinking. Then, while he is still deep in this hypnotic state, suggestions are made against alcohol and to straighten out faulty thinking habits.

Because this treatment has been given to the most difficult alcoholic patients, conditioning the patient to feel aversion to the sight, smell, taste and thought of alcohol with the drug emetine was found to give better results, the report pointed out.

A three-year follow-up of 479 patients receiving either pentothal, or the hypnotic and the conditioning treatment, showed that 58% of the patients had not returned to alcohol.

Pentothal is very effective in relieving the nervous tension and worry in alcoholics, the doctors said. This is the same effect that patients seek in alcohol. However, the drug made some patients so wild that they were unmanageable and treatment had to be stopped. Others got a craving for more frequent doses of the drug which could usually be controlled.

Treatment usually can be stopped in six to 12 months, the doctors found. A few patients need the drug for as long as two or three years but the physicians feel that it is the lesser of two evils, since it keeps them away from alcohol.

The combined treatment was given patients who had an emotional basis for

drinking, or who had a psychopathic personality, neurosis, psychosis or a criminal record. All patients under 30 were also found to need pentothal in addition to a conditioned aversion to drink. Pentothal alone was given to patients who were not physically fit for the more difficult conditioning treatment, such as those with heart disease.

Science News Letter, June 18, 1949

MEDICINE

Relief for Shaking Palsy Promised by New Drug

► EFFECTIVENESS of a new drug in providing relief from some of the disabling symptoms of shaking palsy was announced by Dr. Kendall B. Corbin of the Mayo Clinic to the American Medical Association.

The new spasm-relieving drug, artane, was given to 104 patients. Dr. Corbin noted that it helped to relax the rigidity of their muscles, making them feel more limber and able to move with greater ease. In over half of these patients there was also relief from tremor.

If future trials bear out the present promise of this drug it may challenge the status of the belladonna alkaloids in the treatment of this disease. Dr. Corbin found that it gives symptomatic relief comparable to or greater than that of the belladonna alkaloids.

Eighty patients had some relief from symptoms while getting this treatment and preferred the drug to others because there were less unpleasant reactions to it. Fifteen patients did not get enough help to justify further treatment with artane, while nine

patients either preferred other treatment or were made worse.

Dr. Corbin said that he put some patients back on their former treatment when the effectiveness of artane began to wear off but the patients themselves usually asked to return to the drug.

The unpleasant side effects, noted in 41 patients, were dryness of the mouth, nausea, giddiness, blurring of vision, jitteriness, tightness in the head and soreness of the mouth. Four had severe reactions, including mental confusion, dizziness with nausea and marked agitation.

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POPULATION

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MEDICINE

Measure Drinking Capacity

The maximum a man can drink in one day has been found by experiments on the alcohol consumption of dogs. The results are believed applicable to humans.

➤ A MAN of average weight (about 154 pounds) can, at most, drink one quart of 100-proof liquor in a day. And he can manage that only with a "high level" of alcohol in his blood.

These are the findings of Dr. Henry W. Newman of the Stanford University School of Medicine, San Francisco. If a drinker tells you he consumes two quarts a day, don't believe him, Dr. Newman advises.

His scientific answer to "How much can a person drink?" was inspired by the stories of patients suffering from chronic alcoholism. These chronic alcoholics show a "wide variation in estimates given by them when asked how much they drink daily," observes Dr. Newman.

"In general," he notes, "they fall into one of two classes: those who state that they never take more than a couple of beers, and those who stoutly maintain that they consume up to two quarts of whisky every 24 hours."

Doctors need to know how much a person can drink in a day to know what to believe in these stories, the Stanford scientist explains. To find out just how much alcohol a person can down in a day, Dr. Newman did not set up a scientific bar. Instead, he turned to scientific literature and performed some laboratory experiments. The conclusions are based on the alcohol consumption of dogs, but they can be adjusted to apply to humans, he finds.

Dr. Newman's report, entitled "Maximal Consumption of Ethyl Alcohol," is published in the journal, *SCIENCE* (June 10).

Studying earlier reports of alcohol consumption by dogs, Dr. Newman calculated the probable human limits. Then he used two human subjects in experiments which showed that estimates based on dog experiments could be adjusted to apply to humans. Some experiments have put the top human alcohol capacity as low as less than a pint of 100-proof whisky a day. This, Dr. Newman points out, may have been because the alcohol metabolism was not considered to be changing. The body does, he shows, increase the rate at which it can use the alcohol as the dosage goes up or the blood alcohol concentration is raised.

Thus, the person weighing about 154 pounds (70 kilograms, scientifically) will be able to consume a full quart of 100-proof liquor only when the blood's alcohol concentration is up. Dr. Newman's calculations indicate that a heavier person might be able to consume more alcohol.

For further studies of the question, Dr. Newman urges a "direct experimental ap-

proach." This type of experiment with human subjects, "should certainly some day be made," he declares.

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ENGINEERING

New Type Carbon Arc Lamp Promises Double Brightness

➤ A ROTATING carbon disk replaces the conventional negative carbon rod in a new type of arc lamp developed at Fort Belvoir, Va., at the Army Engineer Research and Development Laboratories. The new lamp gives promise of greatly increased life and double the brilliancy of lamps now used in searchlights.

It is expected that this new carbon arc lamp will have 30 times the normal, measured in terms of uninterrupted illumination. It will be twice as bright as the present standard 60-inch military searchlight arc. In tests already made the rotating disk negative electrode was found to have

lost only 50 grams of weight in eight hours of operation. The disk is 12 inches in diameter and a quarter inch thick.

The arc is formed between one end of the positive carbon and the negative disk. Due to the non-uniform magnetic field around the arc proper, there is a tendency for the cathode spot, or "foot" of the arc to move slowly out of the disk away from the carbon, scientists state.

To compensate for this action, the disk must be rotated. Rotation is accomplished through suitable gearing by a small motor. The positive carbons are fed by automatic mechanism, and are liquid cooled. Combining the accumulated advantages of the revolving disk negative and the liquid cooled positive with magazine feed, an uninterrupted light of 150,000 candlepower will be possible for periods up to two days.

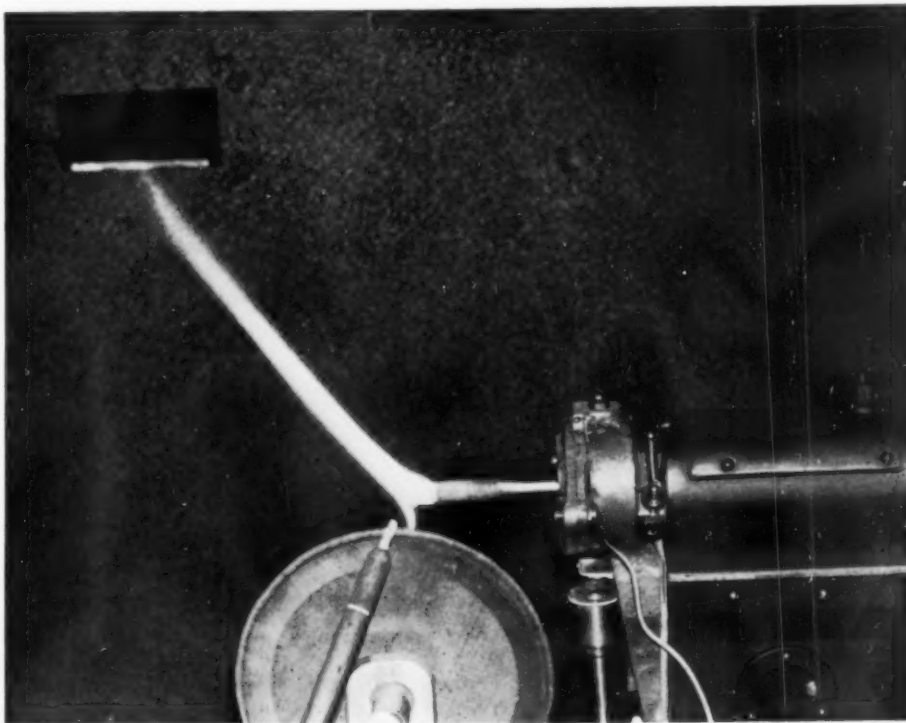
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MEDICINE

B Vitamin Lack May Cause Hardening of Arteries

➤ LACK of one of the B vitamins, pyridoxine by name, may be responsible for arteriosclerosis, better known to the layman as hardening of the arteries.

Studies over a three-year period that give "most suggestive evidence" for pyridoxine lack being concerned in artery hardening were reported by Drs. J. F. Rinehart and



LONGER LIFE AT DOUBLE BRILLIANCY—This is the promise of a newly developed revolving disk carbon arc light. Location of the arc "foot" in relation to the positive carbon, and the speed-controlling tungsten electrode is shown.

L. D. Greenberg of San Francisco at the meeting of the American Heart Association in Atlantic City.

Monkeys kept in a state of pyridoxine lack for six months develop artery damage that is "surprisingly" like that seen in human patients with arteriosclerosis.

As in the human disease, the blood vessel walls of monkeys in the experiments showed a loosening of the innermost layer or coat. The ground substance on which this inner artery layer rests loses its quality of an effective cement. Accompanying these changes in the vitamin lacking monkeys, certain cells of the inner artery wall multiply rapidly, forming spots of fibrous tissue that

narrow the arteries. These spots are widely scattered. Arteries of the heart and other internal organs are involved to a greater or lesser extent in all the vitamin-deficient monkeys. In many the internal elastic membrane of two large blood vessels, the aorta and the iliac vessel, splits and reduplicates.

How much of the vitamin, pyridoxine, is needed by humans and how many persons are deficient in the vitamin are not known. It is believed that the vitamin is needed for normal utilization of protein and that defects in protein handling which come when the vitamin is lacking are responsible for the degenerative changes in the blood vessels.

Science News Letter, June 18, 1949

MEDICINE

Diabetes Spotting Test

► "TILLIE", the "tin technician," made her debut at the meeting of the American Medical Association.

Tillie is a machine that performs a blood test for sugar. Within two months, many Tillies will be rolling off the production line, ready to help in the fight against diabetes.

A million Americans—men, women and children—are estimated to be victims of this disease without knowing it. Finding these diabetics so they can get treatment before the disease threatens life is the object of the American Diabetes Association.

A new, simple test for mass detection of diabetes has been developed by Dr. Hugh L. C. Wilkerson of the U. S. Public Health Service. The test is made with a few drops of blood taken from the finger. Pills of

various chemicals are added to the blood in a small tube, and the tube and contents are heated. Development of a blue color tells whether the person's blood contains so much sugar that he might have diabetes. He is then urged to see his doctor for more tests and examination to determine whether he does have the disease.

Tillie, the new machine made by Lessells and Associates of Boston, performs the test automatically in 30 seconds. Blood from six persons can be tested simultaneously. As the tubes revolve, the chemical pills drop in, heat is applied and the tubes finally pass through the path of a photoelectric cell. If the blue color has developed, the cell signals this fact by either a bell or a light.

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BIOCHEMISTRY

New Anti-Clotting Drug

► SUCCESS in the first use of a new, synthetic anti-blood clotting drug in 11 human patients was announced at the New York Academy of Medicine.

The new drug may become a substitute for the relatively scarce and costly heparin now used to overcome dangerous blood clotting tendency in certain heart and blood vessel diseases. It is a sulfated mannuronic acid. It will be known by the trade name of Paritol.

Paritol was synthesized by research chemists at the Wyeth Institute of Applied Biochemistry, Philadelphia, under the direction of Dr. Joseph Seifter. Reporting on the new drug besides Dr. Seifter were Dr. C. W. Sorenson, research fellow at Cornell University Medical College, and Dr. Irving S. Wright of the New York Hospital, chairman of the American Heart Association's committee for the evaluation of anti-coagulants.

Heparin is a naturally occurring sub-

stance, found most abundantly in the liver. It is expensive because it must be extracted, by costly and laborious processes, from animal livers and other tissues. Dicumarol, another anti-clotting drug found originally in spoiled sweet clover, has now been made synthetically. Slower-acting than heparin, it is used for patients who do not require emergency treatment but do need prolonged periods of anti-clotting treatment.

Paritol is similar to heparin chemically, acts quickly, and while larger doses are needed, it has a more prolonged action. It is an extremely powerful drug and, like heparin, produces a certain percentage of undesirable reactions. In all cases, however, these have cleared up by themselves or responded to treatment with epinephrine. No signs of permanent damage have been detected. The drug is not yet ready for general use.

Of the other synthetic heparin substitutes developed in the search that led

to Paritol were two that had to be discarded because they would have given the patients a bluish lasting several weeks. These were the dyes, Chlorazole Fast Pink and Pontamine Red.

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MEDICINE

Elderly Mothers-to-be Reassured as to Safety

► REASSURANCE was offered to elderly women becoming pregnant for the first time. They stand in no greater danger than the elderly woman who has borne a child before, Dr. L. A. Calkins of the University of Kansas Medical Center, Kansas City, told the American Medical Association.

Although these women tend to have more abnormal deliveries they have no serious effect on the mother or child, he said. The reason that there are more cesarean operations among the older pregnant women is due to a greater prevalence of heart disease and the fear of complications in labor, he explained.

Dr. Calkins, however, urged a thorough examination of these elderly women to rule out major complications which are apt to occur in this age group such as fibroids, diseases arising from high blood pressure, and cancer.

Dr. Calkins based his opinions on a study of 9,867 births, the majority of which were delivered under his direction. Young and elderly mothers were included in the series.

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MEDICINE

Emotional Stress May Bring on Asthma Attacks

► AN asthmatic attack may follow the accumulated pressure of worry and work, Dr. Francis M. Rackemann of the Massachusetts General Hospital, Boston, told the American Medical Association.

A business man under constant pressure or a housewife with endless routine tasks and family troubles will develop asthma if the susceptibility exists in these people, Dr. Rackemann told the doctors.

This emotional basis for the disease should be taken into consideration if asthma develops after the age of 40, Dr. Rackemann said. He added that after this age the condition is generally caused by trouble inside the patient and not by an allergy.

Fear of the asthma is another emotional aspect of the disease which the doctor should consider. Dr. Rackemann recommends that patients should be taught how to control their symptoms and stress should be laid on their individual needs rather than on the disease. He said that deaths have resulted from acute attacks of the disease which apparently were produced by emotional upsets.

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MEDICINE

Hormone Aids Rheumatics

Compound E, rechristened cortisone, may be effective against both rheumatic fever and rheumatic heart disease. It is on trial for rheumatoid arthritis.

► RHEUMATIC fever and its dangerous sequel, rheumatic heart disease, may eventually be conquered by the same gland hormone that is now under investigation as a treatment for rheumatoid arthritis. This is the hope in the latest report from the Mayo Clinic scientists who have pioneered the work with this hormone. (See SNL, April 30, p. 277).

Success in treatment of four patients with rheumatic fever and one with rheumatic heart inflammation with fever was reported by the group at the International Congress on Rheumatism Diseases. The Mayo Clinic anti-rheumatism team consists of Drs. Philip S. Hench, Edward C. Kendall, Charles H. Slocumb and Howard F. Polley. Dr. Kendall is the biochemist who discovered the compound used.

Known first as "compound E," it has now been rechristened cortisone. The name was changed because too many people were confusing this synthetic hormone with vitamin E, an entirely different substance, and buying the vitamin at drugstores in the mistaken belief that it would help their arthritis.

Dr. Kendall first discovered cortisone as

a hormone produced by the outer part of the adrenal glands, small organs lying one atop each kidney. He and chemists at Merck and Co. have since developed methods for producing it synthetically.

Although it has produced striking relief of symptoms in 16 patients with rheumatoid arthritis, literally enabling some bed-ridden arthritics to get up and walk, symptoms return when the drug is stopped. And the difficulty of making it keeps the supply so short that the doctors have only enough for 20 patients and only can get enough for one week in advance.

Women taking the compound get rounded faces, but this baby-face effect is marred by a growth of hair like a beard. They do not get any masculinizing effects, such as change of voice, however. They also get very hungry, eating up to 6,000 calories a day if allowed that much food. And they gain weight, sometimes as much as four pounds in a day. The weight, however, is mostly water which they later lose.

These side effects, which afflict women more than men, are among the problems still to be overcome before cortisone can

be considered ready for general use. Biggest of the problems is the one of supply. Others are concerned with the best dosage and best method of giving the compound, whether daily or weekly.

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MEDICINE

Scientists Discover What Happens in Heart Flutter

► SCIENTISTS now know what happens when some hearts flutter. In physically ailing hearts in some cases, the flutter contraction flies off in all directions from a point. It was previously supposed the flutter went in one direction in a "circus" or ring movement.

Slow motion pictures of the flutter wave, taken through an opening in the chest wall in dogs, showed this to be the case, Drs. Myron Prinzmetal, Eliot Corday, T. C. Brill, Alvin L. Sellers, Walter A. Flieg and H. E. Kruger of Los Angeles reported at the meeting of the American Heart Association in Atlantic City.

The heart flutter they studied is one occurring in the auricles of the heart. These are the two chambers that receive blood from the lungs and general circulation. The ventricles, which pump blood out of the heart, are no longer able to respond to the impulse from the auricles when they start fluttering, so a partial or complete heart block is set up.

Science News Letter, June 18, 1949

MEDICINE

Heart Disease Is Greatest Killer Among Mine Workers

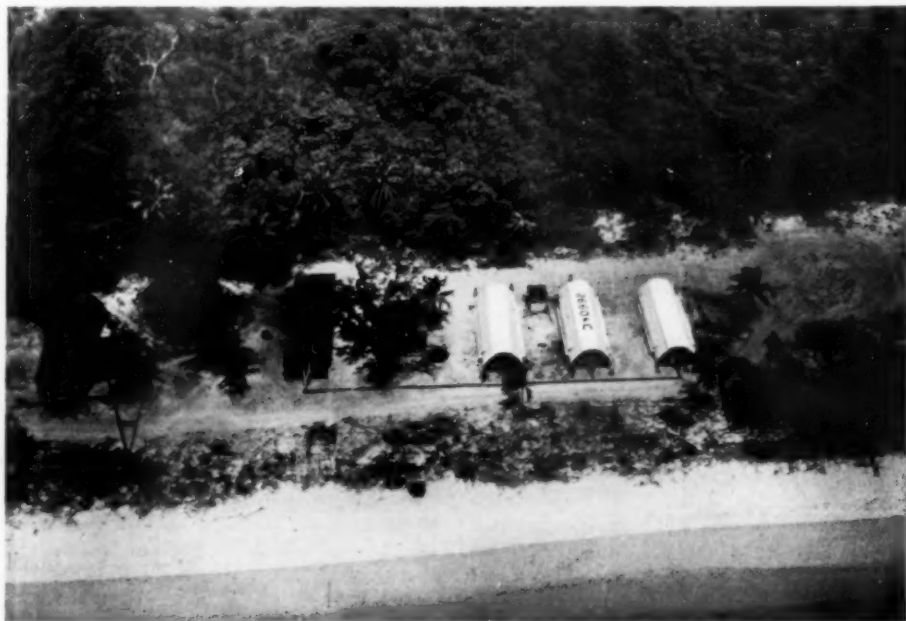
► HEART DISEASE and not tuberculosis takes the greatest toll of lives among coal miners. This fact, contrary to popular impression, was reported by Dr. H. A. Slesinger of Windber, Pa., to the meeting of the American Medical Association.

Although the development of miners' asthma, the name sometimes given for the disease which results from inhaling too much dust, makes the patient more susceptible to TB, other factors also enter into the picture, he said. The prevalence of TB in the community and the presence of previous infection influence the frequency of TB in these patients.

Two other diseases, pneumonia and lung abscess, have lost their position as common causes of death among miners, thanks to the antibiotics and sulfa drugs.

Hard coal miners have until recently been thought to be the only ones exposed to the danger of developing the lung infection which comes from inhaling minute particles of dust in the mines. It is now recognized as an occupational disease among soft coal miners as well, Dr. Slesinger pointed out.

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LINK IN LORAN CHAIN—A typical loran station of the type now in use on a dozen islands in the Pacific is shown above. It perhaps is a symbol of the lonely life lived by the Coast Guard men who operate them. These stations play an important part in both surface and air navigation. By means of radio beams received simultaneously from two of them, a ship or airplane gets its true geographical position.

INVENTION

Washing Machine Squeezes Out Water by Air Pressure

► A WASHING machine that squeezes by air pressure the water out of the clothes while still in the washer, just awarded a government patent, is said by the inventor to be economical, simple, safe and efficient in use, and to remove more of the water than other types of machines.

Patent 2,472,682 was granted to Henry J. Rand, Fairfield, Conn., for this household labor-saving device. He has assigned it to the H. J. Rand Washing Machine Corp., Cleveland, Ohio. In connection with its use an air pump is essential. The inventor states that the diaphragm type of compressor used for paint spraying is satisfactory for the purpose.

The squeezer itself is a collapsible lining of the clothes container of the washer. Normally it rests against the sides of the tub, with clothes and water within it. There is an air-tight cover to place over the opening on the top of the tub through which the clothes are inserted. When the washing is completed, ordinary washing machine equipment doing the job, air is removed from the container with the help of the pump, the lining collapses, and the pressure drives out the water through a drain pipe on the tub's bottom.

Science News Letter, June 18, 1949

DERMATOLOGY

Skin Diseases Barometer of Nation's Financial Status

► A BAROMETER to the nation's financial status can be found in the offices of skin specialists caring for industrial workers, Dr. John Godwin Downing of Boston University School of Medicine declared at the meeting of the American Medical Association.

When a lay-off is impending, a "flood" of patients with "disabling" skin eruptions comes to the industrial skin specialist's office, he said.

"During the lush period of the war there were no cases of malingering; employees never stopped work except when a severe dermatitis occurred, and they returned before it was relieved," he said.

"During the first two months of this year I have had more cases of claims for slight eruptions with which the patient has worked until he was laid off or sensed a layoff. These workers have learned that a slight eruption on the hands can be labeled as disabling."

Dr. Downing sees in this experience an argument against socialized medicine. "When one thinks of the number of claims made for medical care and compensation in this group of industrial cases (where an injury to the plaintiff is supposed to be proved)," he said, "imagine the tremendous

number of claims that will be made for medical care and remuneration under a law that will supply such benefits for all sorts of fancied pains and aches by means of a universal medical program such as socialized medicine."

Dr. Downing explained that it is difficult to distinguish the neurotic from the malingerer. Self-inflicted injuries are caused by primary irritants of the skin—mechanical, physical and chemical—applied with the intention of obtaining compensation, he said. Males predominate in this group. To the expert, the self-inflicted dermatosis (skin trouble) is self-evident, he added.

Science News Letter, June 18, 1949

MEDICINE

New Sulfa Drug Effective For Internal Infections

► A NEW sulfa drug, called NU-445, is proving effective in fighting infections of the urinary and digestive tracts, Drs. Grayson Carroll and Hollis N. Allen and Miss Helen Flynn of St. Louis reported at the meeting of the American Medical Association.

Some germs that were highly resistant to streptomycin were promptly overcome by the new drug. It is extra useful because it is very soluble, so it can be given by injections into veins and muscles in addition to other ways.

An "attractive feature" of the drug, the scientists reported, is that it apparently is not toxic in the doses needed to clear up infections and patients can take it without being upset by the drug.

Chemical name for NU-445 is 3, 4-dimethyl-5-sulfanilamidoisoxazole.

Science News Letter, June 18, 1949

MEDICINE

High Toll of Fractures Reported in Ski Accidents

► WOULD-BE skiers may have their enthusiasm dampened by the report that in five years 305 major fractures resulted on the slopes of Mt. Mansfield in the Stowe, Vt., area.

Dr. Robert L. Maynard told the American Medical Association that in addition there were more than 200 patients who were given medical or surgical treatment for other injuries at the small Copley Hospital. This still does not take into account the many who received treatment elsewhere, after suffering injuries on these same slopes.

The ski injuries were most often broken leg bones. Other accidents resulted in broken arms, ribs or pelvis. Dr. Maynard pointed out that twisting strains are responsible in the majority of cases for fractures in the lower part of the body among ski casualties.

Science News Letter, June 18, 1949

IN SCIENCE

DERMATOLOGY

Skin Blemishes Sanded Away in New Treatment

► SKIN blemishes left by acne and smallpox are sanded away by techniques shown to doctors at the American Medical Association meeting in Atlantic City.

On large areas of skin the sterilized sandpaper is used flat or wrapped over a bandage roll. For fine marks and for getting at curved places, such as around the nose, an electric sander with stones and bristle disks is used.

The techniques are being used by Drs. Claire L. Straith, William G. McEvitt, Ord C. Blackledge, Morrison Beers and Richard E. Straith, plastic surgeons of Detroit.

Carbon marks, stains and bits of debris that get embedded in the skin in accident cases may also be successfully removed by the sanding procedures. Tattoo marks have been sanded off by the same methods. "Results," say the Detroit doctors, "are gratifying alike to both patient and surgeon."

Science News Letter, June 18, 1949

MEDICINE

Anti-Blood Clot Drugs Aid By Dilating Arteries

► THE GOOD effects of the anti-blood clot drugs, heparin and dicumarol, are due more to this dilating action on the heart's arteries than to their anti-clotting action.

Studies supporting this new theory of the action of these drugs were reported by Drs. Newell C. Gilbert, George K. Fenn and L. A. Nalefski of Chicago at the meeting of the American Medical Association.

By dilating the heart's arteries, the drugs increase the flow of blood through the heart. This, the Chicago doctors think, is the best means for decreasing the damage done to heart muscles as a result of coronary thrombosis, the condition in which a blood clot plugs a branch of the coronary artery in the heart.

Results of giving the anti-clotting drugs to patients, the Chicago doctors said, parallel those obtained by the use of drugs of the xanthine series which dilate the heart's blood vessels.

Further evidence supporting their theory, they said, comes from reports of benefits from the anti-clotting drugs in other kinds of heart disease, such as angina and cardiac insufficiency. In these there is no reason to expect any result from the anti-clotting action.

Science News Letter, June 18, 1949

NE FIELDS

MEDICINE

New Approach Saves Lives Of Polio Patients

► COMPLETE success in the treatment of bulbar poliomyelitis by shifting the attack from the virus to the symptoms was reported by Dr. Thomas C. Galloway of Evanston, Ill., and Dr. Martin H. Seifert of Wilmette, Ill., to the American Medical Association.

In the bulbar type of polio the virus affects the lower brain and makes breathing difficult which deprives the body of oxygen. The patients are unable to swallow or spit up and as a result they may "drown" from the saliva which flows back into the lungs.

Recognizing these dangers, the Illinois doctors used suction to clear the breathing passage. By removing the foods, fluids and vomited matter from the airway they gave the lungs a chance to function again and rid themselves of the dangerous accumulation of carbon dioxide.

That their theory was justified is evidenced by the fact that there have been no deaths in 127 patients with polio treated at the Evanston Hospital over a two year period. Fifteen of these had the usually fatal bulbar form of the disease.

In contrast, they reported that 39 patients died out of 105 with bulbar polio outside of Chicago during this period, while in Chicago 10 of 37 bulbar patients died during 1948.

Science News Letter, June 18, 1949

MEDICINE

New Warning Device Shows Anesthetic Danger

► ELECTRICAL signals from the brain and heart can now be used to give warning when a patient on the operating table is in danger from the nitrous oxide-ether anesthetic given to put him to sleep.

Signs of approaching death can be spotted two minutes earlier by a brain wave machine than by the breathing and pulse rates usually observed by the anesthetist, a Mayo Clinic team reported to the American Medical Association in Atlantic City.

When the regular waves from the brain suddenly flatten out almost to a straight line, after the patient has been quietly sleeping under the anesthetic, the anesthetist knows without any other check that it is time to stop the anesthetic mixture and quickly turn on the oxygen.

This new life-saving development for patients undergoing surgery was developed

by Drs. R. F. Courtin, R. G. Bickford and A. Faulconer, Jr., of the Mayo Clinic.

The method has now been tried in 60 patients. Results have convinced anesthetists and surgeons that operations can proceed more safely than ever with this new warning device to tell them how deeply the unconscious patient is sleeping.

Brain and heart wave records are taken, without affecting the surgeon at his work, by a machine that stands on one side of the anesthetist, while at her other side is her machine for giving the anesthetic and oxygen.

Preliminary trials with cyclopropane instead of the gas and ether mixture suggest that the brain and heart wave signals will be equally effective as lifesaving guides, no matter what anesthetic is used.

Science News Letter, June 18, 1949

MEDICINE

Correct Gland Disorders To Improve Childbirth

► CORRECTING certain gland disorders in advance will help many women who want babies to have them and also will save many of them from toxemia and other complications of pregnancy, two Mayo Clinic scientists, Drs. Lois A. Day and Philip L. Smith, told members of the American Medical Association.

The women who are going to have trouble in having children can be picked in advance and treatment of them can be started before conception, the two Mayo scientists believe on the basis of their own and other studies.

Women whose ovarian function is disordered, as shown by menstrual disturbances and irregularities, are the ones likely to have trouble in bearing children. Among a group of 425 young married women who came to the Mayo Clinic because of such disturbances, over half, or 237, had been unable to conceive in an average period of six years. The other 188 became pregnant but only 126 living children were born, or less than one child per patient.

Miscarriages, premature babies, toxemias, prolonged labor, stillbirths and malformed infants were the unfortunate experiences of the 188 who became pregnant.

For treatment, the Mayo scientists advised general measures, such as hygienic living and diet, and also improvement of menstrual rhythm by doses of estrogen (female hormone), thyroid hormone, or stimulating X-ray treatment to the pituitary gland and the ovaries. This, they said, will assure a better "seedbed" for pregnancy.

Reducing the number of pelvic operations for lower abdominal or pelvic pain would also, the doctors think, "help to improve the gloomy outlook for these patients."

Science News Letter, June 18, 1949

MEDICINE

Doctor and Dentist Find Way To Fight Heart Disease

► A WAY to prevent some cases of a serious form of heart disease was reported at the meeting of the American Medical Association by a physician and a dentist.

As many as one out of every five cases of subacute bacterial endocarditis, an inflammation of the lining membrane of the heart, might be prevented, it appears from figures reported by this doctor-dentist team. The physician is Dr. Paul S. Rhoads, the dentist Dr. Warren R. Schram, both of Chicago.

The discovery that 10 out of 53 patients with this heart disease had a tooth pulled one week or ten days before the heart symptoms started led the doctor and dentist into their attack on this situation.

The way to prevent it, they advise, is to give penicillin or the new sulfa drug, No. 445, also called gantrosan, before pulling teeth.

Germs that get into the blood stream after a tooth has been pulled, they explained, can start the heart inflammation, which in many cases is fatal.

When they gave penicillin or the sulfa drug before tooth extraction, less than six percent of the patients had germs in their blood, compared to over 38% in the non-treated patients.

Science News Letter, June 18, 1949

ENGINEERING

Coral Found To Be Good Aggregate in Concrete

► THE CORAL of the Pacific reefs and atolls is pronounced to be excellent material as a base for airport runways and roads, as in-place foundation material and concrete aggregate, it was revealed by C. Martin Duke of the Los Angeles branch of the University of California who made recent tests on Guam.

Most engineers have held that coral had little value for these purposes, but it was widely used by the U. S. Navy during the war, mainly because it was handy. Its true value has now been determined by experience and special tests. Prof. Duke's investigation shows it to have superior engineering properties. In addition to being a top-grade construction material, it is plentiful.

Mr. Duke lists the reef-derived material in three classifications. One is the geologically young material on top of the reef. This is coral proper. Another is the central mass of the older reefs which is made up of a geologically older material similar to continental limestone, and it can also be used. The third class is "cascajo" which consists of decomposed reef limestone, lagoon sediments, sandy loam and other substances. Its name is a native word of Spanish origin, meaning gravel.

Science News Letter, June 18, 1949

ENGINEERING-CHEMISTRY

Shineless Stainless Steel

New black rustless steel has many applications both for military purposes, where its unreflecting surface affords safety against the enemy, and for jewelry.

By ANN E. EWING

See Front Cover

► A FLASHING, stream-lined railroad train. The speedy X-2 experimental jet plane that flies faster than sound. The shiny spoon on your table or the mirror-like sink in your kitchen.

Rustless, all of them, because they are made of stainless steel, these metal objects in our modern world are symbolic of permanence and untarnished beauty. They are metallurgical science applied and shining most brightly.

Less known and newer is black steel that is rustless. It is steel that has a surface that does not reflect like a mirror and yet resists the inroads of greedy oxygen that rusts and eats away ordinary iron.

Shineless stainless steel is the latest thing in the steel world.

For military purposes where a glint of light might reveal a waiting army, it has obvious advantages.

Novel Jewelry

It is even being used for novel jewelry—dark, somber contrast to more gaudy metals.

Black or shiny, stainless steels are "stainless" because chromium is added to the iron. Stainless steels, technically known as corrosion-resisting, must have at least 11% chromium before they will resist rust.

Shiny stainless steel has a very thin, tight chromium oxide film on the surface. This film is invisible with a powerful microscope as well as to the eye. Even though it can't be seen, this invisible layer is responsible for the corrosion resistance of stainless steels.

The film, if scratched or broken, forms again instantly just as soon as the stainless steel is exposed to the oxygen ordinarily present in the air. Stainless steel is, therefore, corrosion resistant all the way through.

Black stainless steel also has a thin chromium oxide coating. This film is visible to the eye because of its color, although it is only a hundred-thousandth of an inch thick.

Stainless steel is blackened by placing the metal in a molten bath of dichromates at a temperature of 730 to 750 degrees Fahrenheit. After 15 to 30 minutes, the metal is removed from the bath, cooled and rinsed. Its once-gleaming surface is now black, and it is ready for use.

Familiar, shiny stainless steel was once

known as the "jewel" of the steel industry because of its high price and silver-like appearance. Last year over 600,000 tons of the metal were produced in the United States alone. Production of stainless steel grows annually as new uses are found for the 35-year-old marvel metal.

One of the most recent uses for bright stainless steel is for fire extinguishers. Sold at a lower price than the ordinary red fire extinguisher, the gleaming model is lighter, requires less maintenance, and need not be replaced as often.

Ever since the discovery of iron, man has been trying to find some way of outwitting the villain, rust. In 1913, Harry Brearley, hunting for a steel that would withstand continuous fire from naval guns, made many experimental alloys. Some of these were of iron and chromium.

He tested the samples, as usual, in hot sulfuric and hydrochloric acids. For some reason, he decided to test them also in nitric acid. Nitric acid is a very powerful oxidizing agent. To his amazement the iron-chromium mixtures were not affected by the nitric acid.

Immediately Brearley realized that he

had made a great discovery. Rust is a product of oxidation. A metal which resists nitric acid should therefore resist rust. After centuries of vain search, man had found a rust-resisting steel.

At the time of the discovery, Brearley was working for Sheffield, a famous cutlery firm in England. It is not surprising, therefore, that the first commercial use of the new metal was for knives and other utensils.

Cutlery-Type Steel

This original cutlery-type steel contained about 12% chromium and about 3% carbon. Approximately these same percentages are in use today for the stainless steel knives in kitchens and for other stainless steel cutlery.

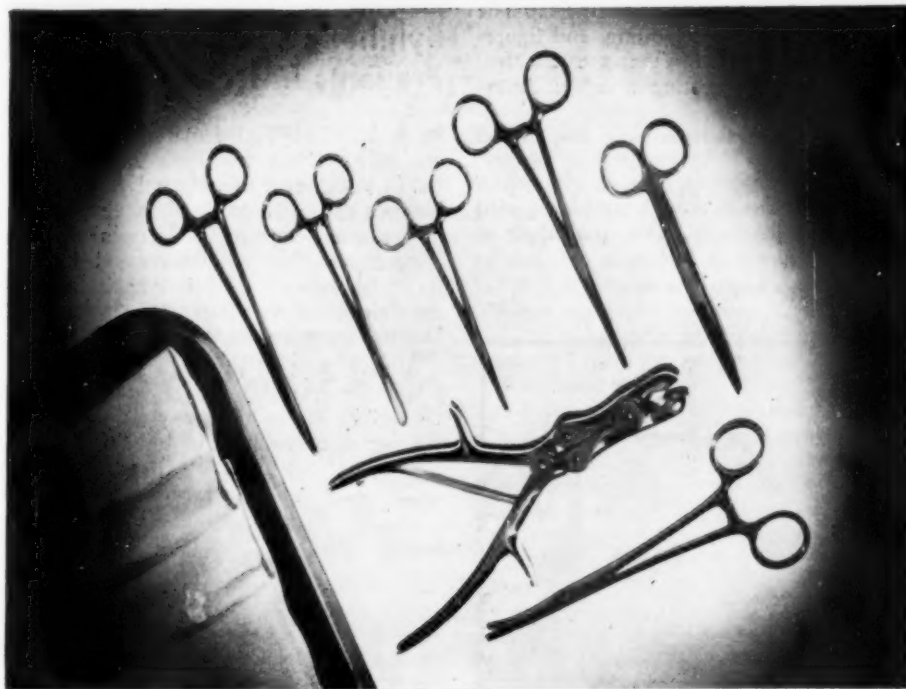
At about the same time as the British development, Benno Strauss, working in Germany, tested the combination of chromium and nickel with iron. He found that the percentages of these metals which resisted rust the best were 18% chromium and 8% nickel.

Stainless steels of this composition are in wide use today. They are known as 18-8 stainless steel because of the percentages of added metals.

The term stainless steel denotes not just one type of steel, but a large family of almost 30 alloy steels. These alloy steels



FOR INDUSTRY—A stainless steel mill cover is being polished for a corn products refining plant.



FOR THE OPERATING ROOM—Here stainless steel makes it possible to keep surgical instruments spotless and ready for action.

divide into three major classes. Two of the major classes, cutlery-type stainless steel and 18-8 stainless steel, were developed by Harry Brearley and Benno Strauss, respectively.

The third major class is an alloy containing 16-30% chromium and a very small percentage of carbon. This type is between the cutlery type and the chromium-nickel type in its resistance to corrosion.

The metallurgists who discovered stainless steel were looking only for corrosion resistance. By adding chromium and/or nickel to the iron, however, they also increased the tensile strength of the steels.

Tensile Strength

The tensile strength of ordinary structural, sheet and plate steels is 50,000 to 60,000 pounds per square inch. Tensile strengths of stainless steels vary from 85,000 to 200,000 pounds per square inch. Through special treatment, stainless steel wires can get tensile strengths up to 350,000 pounds per square inch.

After its introduction through cutlery, the next large-scale consumer use of stainless steel came in 1930 when Henry Ford trimmed the radiators of his model A with the new metal. On today's auto, it gleams not only from the radiator, hub caps, running board, trim and headlights outside the car; but from the dashboard, lamp shells and door fixtures within the car.

There are hidden uses of stainless steel in the modern automobile. Looking inside the engine, you would find stainless steel guarding many "hot spots." It was chosen for these vital parts because it is outstand-

ing in its resistance to heat.

Stainless steel is more expensive than common steel, but it pays for itself in labor, paint, and maintenance costs saved by its use. On this week's cover of the SCIENCE NEWS LETTER a huge chemical vessel is spot welded. Fewer replacement parts are required when stainless steel equipment is used.

An example of this is the dairy industry. With poor cleaning and constant wetting, the pitting of carbon steel in dairy equipment was a serious problem. Frequent replacement of most equipment was required when ordinary steel was used.

The milk that is delivered to your door today almost never touches anything but stainless steel during its trip from the cow to you. Higher cost of the original equipment is more than offset because fewer replacements are needed and maintenance costs are lowered.

Another place where stainless steel pays for itself is in kitchen equipment. Stainless steel is not easily dented or chipped. It is easy to keep clean. It is not stained by food acids. Many factory, cafeteria and institutional restaurants, therefore, use stainless steel for kitchen and counter equipment. It is also being used more and more in home kitchens.

Other elements such as sulfur, columbium and molybdenum are sometimes added to stainless steel to give it particular properties. Molybdenum, for instance, improves the corrosion resistance of stainless steel used in the textile, paper and chemical industries.

Stainless steel has been used for architectural trim for both office and home.

Such famous buildings as the Chrysler tower and the Empire State are protected at key places by this metal.

Your home of the future may have stainless steel panels which will slide to make your rooms big or small as you desire. An architectural exhibit which opens in Washington this fall will feature such a home.

Samples of stainless steels, carbon steel, nickel and ferrochrome (iron and chromium melted together in an electric furnace) have been collected by Science Service. Several experiments you can perform with these metals are explained in a leaflet which accompanies the samples. Write Science Service, 1719 N Street, N. W., Washington 6, D. C., for one of these stainless steel kits at a nominal charge of 50 cents.

Science News Letter, June 18, 1949

SAFETY

Night Traffic Deaths Four Times Daylight Rate

➤ FOUR times as many deaths from traffic accidents per car on the road occur at night as during the day, the President's Highway Safety Conference was told in Washington by Edmond C. Powers, Street and Traffic Safety Lighting Bureau, Cleveland, Ohio. The increased night death rate is chargeable, he said, to defective tail lights, defective headlights, fatigue, fog, alcohol and inadequate visibility.

The four-to-one ratio of night to day deaths is the result of these six factors, he said, which not only increase the chances of accidents at night but which also increase the chances that a night accident will be fatal when it does occur. Inadequate street lighting, particularly in urban areas, is the primary factor.

The analysis presented by Mr. Powers was based on extensive research and detailed study of over 8,000 fatal accidents reported by 20 states for the year 1948. The analysis eliminates the accident factors which are the same day and night and thereby segregates those factors which apply strictly to night accidents.

On this basis, there were 13,800 night traffic deaths during 1948 in the United States due to the factors applying to night accidents. Of these, nearly 10,000 were due to inadequate visibility and 2,636 due to the use of alcohol. Fog was responsible for 516 deaths, and fatigue for 447. The others were due to defective tail lights or headlights.

Some 32,000 human lives were lost during 1948 from traffic accidents. Comparing the 18,400 persons killed in night accidents with the 13,800 killed in daylight is not particularly shocking, he said. But when it is remembered that night traffic is only one-third daylight traffic, and a comparison is made on the basis of the number of vehicles operating, the result is

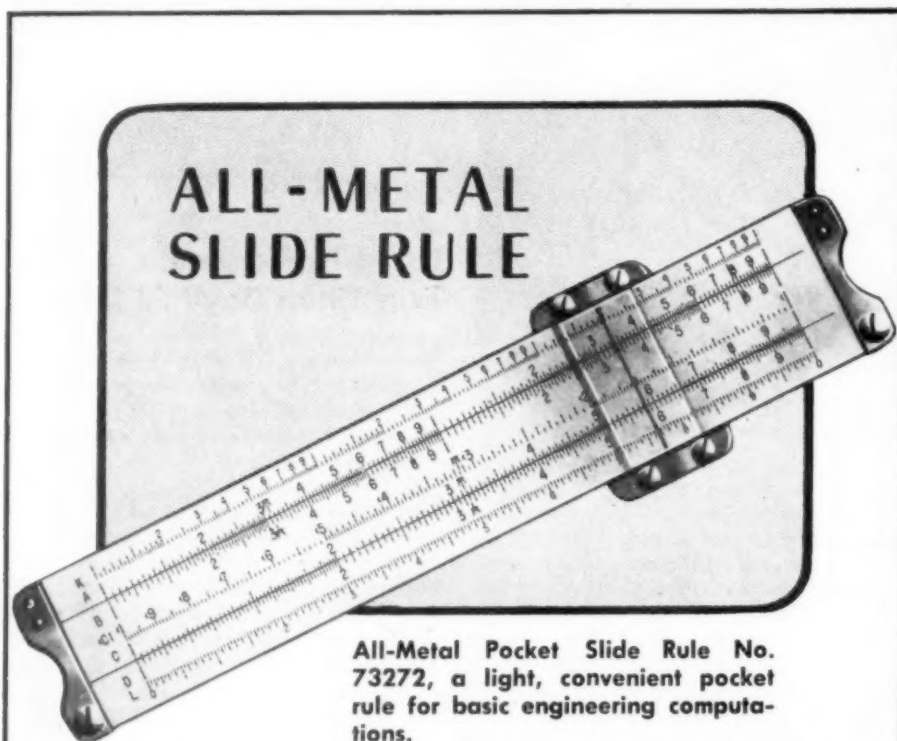
startling. Night deaths from the factors that cause daylight accidents would have been one-third of 13,800, or 4,600. The actual number of night deaths is four times this figure.

Inadequate visibility was the cause of 9,918 of last year's 18,400 night deaths, Mr. Powers emphasized. Inadequate visibility, however, contributed to the deaths from other factors, in his opinion. It increases the dangers of operating with defective lights, increases fog blindness, and it makes

the use of alcohol more apt to be fatal. The answer is better street lighting, and figures were presented to show that greater safety followed adequate lighting in various American cities.

Science News Letter, June 18, 1949

Scientists are attempting to develop a *dwarf sunflower* that will produce a seed high in oil content to add to the supply of edible oils; the dwarf plant is desirable as an aid to mechanical harvesting.



All-Metal Pocket Slide Rule No. 73272, a light, convenient pocket rule for basic engineering computations.

The 5-inch scales are decimally divided and coordinated front and back. Cursor lines on both sides eliminate reversing the slider. The all-metal construction permits precision manufacturing and gives dimensional stability. The materials used—magnesium alloy, lucite and aluminum—will not twist, warp or corrode. The magnesium alloy base metal has a low coefficient of expansion and shows no change in dimensions over a wide temperature range. The plastics coat has been fused to the metal body, and is guaranteed not to peel off or strip. By a patented process, scales are printed photographically on white plastics from a master slide rule.

SCALES: K, A, B, C, D, L, S, ST, and T

DIMENSIONS: Length, 6-3/32 inches; width, 1-3/32 inches

MANUFACTURING: Precision made to ± 0.001 inch

A fine grain leather scabbard-type pocket carrying case is furnished with each rule.—Price, Each \$5.75.

Write for descriptive circulars 1193 and 231 on Pocket, Simplex, Ortho-Phase Duplex, Ortho-Phase Log Log and Deci Log Log Vector Hyperbolic All-Metal Rules.



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MEDICINE

Synthetic Sex Hormone Prevents Miscarriages

➤ A SYNTHETIC female sex hormone can save women from miscarriage in 84 out of 100 cases if the miscarriage threatens between the tenth week and the fifth month of pregnancy. This means of saving lives of unborn offspring was announced by Dr. A. B. Abarbanel of Los Angeles at the meeting of the Association for the Study of Internal Secretions in Atlantic City.

Among patients in the same period of pregnancy who did not get the hormone, the saving of the unborn was achieved at the rate of only 40 out of 100 cases.

Even in the earlier period, up to the tenth week of pregnancy, the hormone treatment made a difference. In the untreated group the salvage rate was 20% compared to 35% for the treated.

The salvage is poor in the early miscarriages, Dr. Abarbanel thinks, because these are caused by blighted egg cells and disturbances in the tissues attaching the egg cell to the uterus as well as to a break in the continuity of blood vessels between mother and unborn baby.

After the tenth week the break in blood vessel continuity is the most common cause of threatened abortion, or miscarriage. Since the natural female hormone is the prime factor in maintaining this blood vessel continuity, Dr. Abarbanel thinks large doses of the synthetic hormone will "repair the break in the dike" and so prevent the loss of the baby.

Science News Letter, June 18, 1949

MEDICINE

New Medical Awards Go to Typhus Martyr's Associates

➤ THE first medals of a newly established national medical award were presented to the teacher and a co-worker of one of America's medical martyrs, Dr. Howard Taylor Ricketts.

Dr. Ludvig Hektoen, first chairman of the department of pathology at the University of Chicago, and Dr. Ricketts' teacher, received the first medal. Second of the medals, formally presented at the same time, went to Dr. Russell Wilder, head of the division of medicine at the Mayo Clinic. Dr. Wilder was working with Dr. Ricketts on typhus fever and after the latter's death remained in Mexico City to complete the work.

The Howard Taylor Ricketts award has been established by Mrs. Ricketts, widow of the man who was first to see the germs of Rocky Mountain spotted fever and of typhus fever and who died of typhus while studying the disease in Mexico in 1910. These and related germs are now called Rickettsia.

Science News Letter, June 18, 1949

POPULATION

U. S. Could Feed Billion

► A POPULATION for the United States of about 1,000,000,000 people could be fed, and a world population of 15,000,000,000 would not seem unreasonable, if proper conservation and full use of available resources were developed, Prof. Eugene G. Rochow of Harvard University said.

He spoke as a guest of Watson Davis, director of Science Service, on Adventures in Science, heard over the Columbia Broadcasting network. Dr. Rochow described possible foods that can be made from materials not now used for the purpose, such as sugar from wood and an edible oil from coal.

The foods available to feed this tremendous population would not be those we eat at the present time. Our descendants on such a crowded earth would not be eating hot dogs and ice cream, he warned. These would be too expensive from the standpoint of chemical resources.

The only way to feed the billions will be to use the world's trees for feeding people instead of using wood for houses and other building purposes. A tree is able to get its mineral nutrients from the subsoil, and hence grows even in rocky areas because

it taps the unleached depths where the proportion of dissolved salts is high. We could get all our carbohydrate requirements by hydrolysing the cellulose in the wood to simple digestible sugars, he said, or by putting microorganisms to work to make saccharides for us.

There would be no meats, he continued, and other sources of protein would be necessary. It seems certain that meat and eggs as sources of protein will gradually vanish, for a beef steer converts only about 12% of its food to meat. It seems much more sensible, he stated, to feed the plant proteins to people directly, as the British have found in the last decade. If fish and plant proteins become too scarce, synthetic amino acids seem to provide the only answer.

Fats are not easy to obtain by microbiological activity, nor do we have enough from plant sources. They can be made synthetically, he declared, and the Germans developed a satisfactory product during the recent war by converting coal to edible fats. Feeding the world would be a job for chemists, he indicated.

Science News Letter, June 18, 1949

MEDICINE

Uncover Abortion Records

► MORE married than unmarried women go to a physician for an illegal abortion operation, the Population Association of America learned from the report of Dr. Christopher Tietze, research associate of the National Committee on Maternal Health and physician of the Johns Hopkins University and Hospital, Baltimore, Md.

This is the first time that the records of specialists in illegal abortion have been made available to the medical world, Dr. Tietze indicated. Little has been known of such cases except through the medium of gossip and the suspicion that they are very numerous.

Dr. Tietze credits good fortune with his coming into possession of a series of 363 records which represent the practice of two such abortion specialists in a large Eastern city during several months in 1948. The records are genuine, complete and probably as good as those kept by most practitioners and clinics, Dr. Tietze assured his hearers.

The average woman who goes to one of these specialists pays from \$300 to \$500 for the operation, the records reveal. Of the 363 women, 102 were single, 180 (49.6%) married and 81 previously married. About half the latter group were widows, the rest divorced. The fact that the largest number of the married women had had two children previously suggests

that these women use abortion not as a method of spacing the children in their families but to limit the size of the families.

It is also used by girls who are very young and not yet ready to assume the responsibilities of parenthood. Of the 102 single women, 25 were less than 20 years old, three being between 10 and 14. Of the 180 married women, 10 were in this age group. There was only one case in this age group among a comparable group of 481 women having normal deliveries of babies in a large hospital in the same city.

Sixty-five women (17.9%) were repeaters at the illegal operation. Fourteen women had had two previous abortions and eight reported three or more. Many had been performed by the same physician.

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PSYCHOLOGY

Emotional Upsets May Affect Reading Ability

► EMOTIONAL upsets can account for difficulty in reading in an otherwise intelligent child, Drs. Joseph F. Hughes, Richard Leander, and Gilbert Ketcham of the Pennsylvania Hospital in Philadelphia told the American Academy of Neurology meeting in French Lick Springs, Ind.

Situations that make the child feel in-

secure such as family quarrels, rivalries with sisters or brothers, and difficulties in social relationships may result in a specific reading disability, they found.

Psychological causes, such as not being taught proper reading habits, and organic causes which may stem from under-activity of the thyroid gland may also be responsible for poor reading ability. But the investigators believe that no child has a specific reading difficulty without at the same time developing some kind of emotional disturbance.

Treatment, therefore, must include psychotherapy as well as corrective aid in reading, they pointed out.

This study was based on mental, physical and brain-wave tests of 125 patients between the ages of seven and 12, except for one who was 30.

The machine which registers the electric wave pattern of different parts of the brain is called an electroencephalograph. Deviations from the uniform patterns given off by a normal brain can be easily detected.

The Philadelphia doctors found that 75% of these patients had an abnormal wave pattern. But outside of this and the emotional disturbances these children did not differ from others of the same age group either physically, mentally or in the number and severity of childhood diseases, the investigators reported.

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Science Service Radio

► LISTEN in to a discussion on "8,000 Miles Per Hour" on "Adventures in Science" over the Columbia Broadcasting System at 3:15 p. m. EDST, Saturday, June 25. Dr. Raymond J. Seeger, chief of the Mechanics Division of the Naval Ordnance Laboratory and Lyman O. Fisher, associate chief of the division, will be guests of Watson Davis, director of Science Service. They will discuss the wind tunnel of the highest speed in the world which will be inaugurated outside of Washington. Predictions of what will be found in wind tunnels by artificial super hurricanes will also be made.

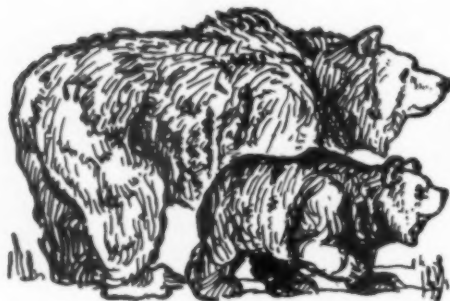
Science News Letter, June 18, 1949

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MANUAL 25c



Beware of Beggars

► BEGGARS, bane of tourism in some of the world's older, poorer lands, are little seen in our more prosperous, prideful country. Yet tourists in some of our national parks frequently encounter mendicants as shameless and brazen as any that might beset them in the Orient. They grow fat and sleek, too, for most of their victims are delighted to make offerings to their greediness.

Beggars in our national parks, to be sure, are not human beings. They are bears, that haunt certain spots by the roadside and await gifts of candy, fruit and other edibles from passing motorists. They are sometimes called "holdup bears," but this is an out-and-out misnomer. There isn't the least likelihood that these beggar bears will back up their demands with violence as genuine bandits would. If you drive right on past them all they do is wait, resignedly, for a driver who may prove an easier sucker.

Park rangers and administrators do not like these beggar bears, and tolerate them only because they are popular with tourists who get a thrill out of momentary familiarity with a wild animal that has had a bad reputation ever since the days of the prophet Elisha. They do bring some profit to the park stores where the chocolate bars are bought, and to the photographic shops

where the tens of thousands of hastily snapped films are developed and printed.

If you should encounter one of these hairy beggars masquerading as a bandit, and feel that you really must stop and get a snapshot, here are two recommended safety procedures: Preferably, don't get out of your car. Toss your candy bar onto the ground at good snapshot range, and get your picture as the bear picks it up. If you can't use your camera without dismounting, be even more careful to keep your

distance. Never under any circumstances hold your offering at arm's length and invite the bear to come up and eat out of your hand. A bear is all too apt to bite the hand that feeds him, not because he is ungrateful but simply because of all dumb animals the bear is about the "dumbest." And a mere awkward wave of his paw, without any hostile intent, might easily tear off half your face or smash the ribs over your heart and kill you.

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ACOUSTICS

Ears Muffle Own Noise

► THE croaking of a frog, the bawling of a calf, the crowing of a rooster, or the bellow of a baseball fan angered by an umpire, do not sound as loud to the individual making the noise as to those around him.

Why this is so is explained by Dr. Georg V. Bekesy, of the Psycho-Acoustic Laboratory, Harvard University. The reason is to be found in the structure of the ear which is equipped with automatic means of reducing its sensitivity to the vocalizations of the same animal.

When a frog croaks, he opens his mouth and vibrates the end of his tongue. Although these vibrations subject the eardrum of the frog to intense sound pressures, these pressures are balanced by the vibrations inside the mouth. Acting on both sides of the eardrum at the same time, the net vibration is greatly reduced. This equalization of pressures is aided by the great width of the Eustachian tube of the frog. If you look into the open mouth of the frog, you can see about half of the eardrum through the Eustachian tube. When the frog shuts his own mouth, he can then hear his neighbors.

The rooster has a different mechanism for automatically muffling his own crowing. He stops up his ears when he raises his head to crow. The opening of the ear canal of the rooster is surrounded by a cartilaginous ring which can be pulled very easily in one direction so as to close the ear canal. This pulling takes place whenever the rooster lifts his head to crow.

Man, like the frog, opens his Eustachian tube when he opens his mouth to roar (or yawn).

Hearing by bone conduction of one's own voice is limited by the position of the inner ear deep in the head where vibrations by bone conduction are kept at a minimum. The ear is so placed in animals with thick, bony skulls, such as the ox and man.

If it were not for these and other automatic means of reducing the noise we make ourselves, we should find most annoying not only our own voices, but the sounds made by chewing and swallowing. Even walking produces vibrations of the body which can be heard if the ear canal is

closed. The vertebrae of the spine cushion some of these vibrations.

In dogs, cats, mice and other small mammals in which the size of the middle ear is greater than the thickness of the bony wall of the skull, the middle ear is surrounded by a capsule called a bulla. This structure also serves to minimize the bone transmitted vibrations.

The bony structure of the middle ear serves the same purpose. When you use your voice, the vibrations set up in your skull are at a minimum in the direction parallel to the axis of the ear canal, and at a maximum in vertical to it. The bones of the middle ear are so constructed that a movement of the bone called the hammer in the direction of its long axis does not cause a displacement of the fluid in the cochlea.

Dr. Bekesy's report appears in the JOURNAL OF THE ACOUSTICAL SOCIETY OF AMERICA. (May).

Science News Letter, June 18, 1949

Words in Science—
CYCLONE-TORNADO

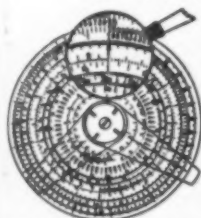
► A CYCLONE is a circular area of low atmospheric pressure around which the winds blow counter-clockwise in the northern hemisphere, and clockwise south of the equator.

Hurricane is the name given to a tropical cyclone, especially one in the West Indies. It is also the designation of the highest wind force on the Beaufort Wind Scale, those 75 miles an hour or faster. In the China Sea area, a hurricane has the special name typhoon.

Tornado is the name used for the violent rotary storms occurring in southern and central United States. These winds, known popularly as "twisters," are calculated to attain a speed of higher than 300 miles an hour. The updraft inside the funnel cloud may blow at 100 to 200 miles per hour. The path is short, averaging about 300 miles. A hurricane, by contrast, may cover thousands of square miles and have a diameter of 1,500 miles.

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Books of the Week

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ADVANCES IN CATALYSIS AND RELATED SUBJECTS, Vol. 1—W. G. Frankenburg, V. I. Komarewsky, and E. K. Rideal, Eds.—*Academic Press*, 321 p., illus., \$7.80. Authorities in science and industry contribute surveys of their respective fields.

AIRPORTS AND AIR TRAFFIC—John Walter Wood—*Coward-McCann*, 159 p., illus., \$3.75. What to do in our regional planning of airports for urban areas.

BACTERIAL AND VIRUS DISEASES: Antisera, Toxoids, Vaccines and Tuberculin in Prophylaxis and Treatment—H. J. Parish—*Livingstone*, 168 p., illus., \$2.75. A guide to the essential principles of immunology and their practical application in human medicine.

BATS OF THE GENUS MICRONYCTERIS AND ITS SUBGENERA—Colin Campbell Sanborn—*Chicago Natural History Museum*, 19 p., illus., paper, 50 cents.

THE CATHODE-RAY OSCILLOSCOPE—George Zwick—*Radcraft*, 112 p., illus., paper, 75 cents. A simple explanation of a. c. theory and electronics for the radio serviceman and the newcomer in radio.

COMMON SENSE ABOUT FUND RAISING—Robert Keith Leavitt, 75 p., \$2.00. A comparison of the Super Fund advocates with the claims of those who crusade for independent campaigning by a widely known consultant and writer on public relations.

DIRECTORY OF BUSINESS, VOCATIONAL AND DIVERSION MAGAZINES: UNITED STATES—*Commercial Engraving*, 72 p., paper, \$1.50.

EDUCATION DIRECTORY: Part 4, Education Associations and Directories—*Gov't Printing Office*, 57 p., paper, 15 cents. The publications of each association are also listed.

EDUCATION IN BOLIVIA—Raymond H. Nelson—*Gov't Printing Office*, 90 p., illus., paper, 25 cents. A study of the elementary, secondary, and higher educational systems including a brief resume of vocational schools.

EXPERIMENTS ON MASS COMMUNICATION, Vol. 3—Carl I. Hovland, Arthur A. Lumsdaine, and Fred D. Sheffield—*Princeton University Press*, 345 p., illus., \$5.00. The third in the series of Studies in Social Psychology in World War II (see SNL May 21, 1949) evaluates various Army films and programs designed to make the soldier aware of the ideological issues behind the war.

FAUNAL RELATIONSHIPS OF RECENT NORTH AMERICAN RODENTS—Emmet T. Hooper—*University of Michigan Press*, 28 p., illus., paper, 35 cents. Where the various families and genera of present day rodents are found.

A GUIDE TO THE COLOR SYSTEMS—Kroch's, illus., paper, free upon request to publisher, 206 N. Michigan Avenue, Chicago 1, Ill. Discusses the technology of the four different color systems, Munsell, Ostwald, Cheskin and Colorimetry.

THE HOUSE OF GOODYEAR—Hugh Allen—*The Goodyear Tire and Rubber Company*, 691 p., illus., \$3.00. The story of the development of a large rubber company.

LAND AND FRESH-WATER MOLLUSKS FROM PERU—Fritz Haas—*Chicago Natural History Museum*, 16 p., illus., paper, 30 cents.

OCEAN SURFACE WAVES—Roy Waldo Miner, Ed.—*New York Academy of Sciences*, 572 p., illus., paper, \$3.00. Technical reports of recent research in oceanography.

PLANNING FILMS FOR SCHOOLS: The Final Report of the Commission on Motion Pictures—Mark A. May, Chairman—*American Council on Education Studies*, 34 p., paper, 50 cents. Supported by a grant from the Motion Picture Association of America, the commission studied the needs of schools for teaching films in the fields of geography, problems of democracy, mathematics, music, and art.

PROSPECTING FOR URANIUM—*Gov't Printing Office*, 123 p., illus., paper, 30 cents. Prepared by the U. S. Atomic Energy Commission and the U. S. Geological Survey, this booklet gives information on the occurrence, identification, and the sale of uranium-bearing ores.

THE PSYCHOLOGY OF PERSONAL ADJUSTMENT—Fred McKinney—*Wiley*, 2nd ed., 752 p., illus., \$6.00. A guide to mental health for students of college age.

MEDICINE

Multiple Sclerosis Aided

➤ A NEW treatment for multiple sclerosis was reported by Drs. Leon Roizin, A. Friedman, H. M. Harter, and H. A. Abel of the Psychiatric Institute in New York City to the American Academy of Neurology.

It consists of an enzyme called cytochrome C, two vitamins, thiamine and folic acid, and an anti-blood clotting drug, dicumarol.

This combined treatment is aimed at what the doctors believe to be one of the underlying causes of multiple sclerosis, faulty cell mechanism. Body tissue is known to be generously supplied with the enzyme cytochrome C which is essential to cell growth. This complex protein is important in handling the oxygen of cells. It was discovered that if there is not enough thiamine or folic acid present the body content of the enzyme is reduced.

Another condition found in patients with this disease is the abnormal tendency of the blood to clot rapidly. Dicumarol, originally found in spoiled sweet clover, and now made synthetically, was therefore added to the combined treatment as an anti-coagulant.

In 50 veterans treated for several months the researchers noted that the patients felt better and showed improvement in their disease without ill effects. However, they

RADIO AND TELEVISION MATHEMATICS: A Handbook of Problems and Solutions—Bernhard Fischer—*Macmillan*, 484 p., illus., \$6.00. Gives the solution for nearly 400 problems typical of those encountered in the construction, operation, and servicing of radios, television and other electronic equipment.

THE SITUATION IN BIOLOGICAL SCIENCE—T. D. Lysenko and others—*International*, 636 p., \$5.00. The complete stenographic report presented before the Lenin Academy of Agricultural Sciences of Lysenko's and his colleagues' theories which led to international controversy.

SOCIAL SCIENCE AND THE ATOMIC CRISIS—Hornell Hart—*The Society for the Psychological Study of Social Issues*, 30 p., illus., paper, 75 cents. Urging a Manhattan Project of social sciences to find the solution for problems raised by the bomb. A condensation of a book-length prize-winning manuscript.

SUGAR: Its Production, Technology, and Uses—Andrew van Hook—*Ronald*, 155 p., illus., \$3.00. Brings together in understandable form previously scattered information.

SYPHILIS: Its Course and Management—Evan W. Thomas—*Macmillan*, 317 p., illus., \$5.50. For the medical profession.

TELLING THE STORY OF ENGINEERING RESEARCH—Herbert B. Nichols, John M. McCullough, Ron Ross and others—*American Society for Engineering Education*, 43 p., illus., paper, 50 cents.

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warned that this treatment is still on trial. In multiple sclerosis there is a tendency for abatement of symptoms so they feel it is still too early to make a definite statement about the effectiveness of the combined treatment.

There is no known preventive or cure for multiple sclerosis at present. It strikes men and women in the prime of life, affecting their central nervous system with such symptoms as double vision, inability to coordinate muscles, speech disturbances and emotional or mental instability.

Science News Letter, June 18, 1949

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⚙️ **ELECTRIC PLUG**, a simple type installed without tools or screws, consists of an outer plastic shell and an inner unit or insert with two prongs. To wire, the inner unit is pulled out of the shell, the prongs are separated, and the wire is pushed into it without removal of insulation. The closed prongs hold the wire and make electrical connection.

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⚙️ **POURING SPOUTS**, which are quickly snapped on liquid containers from bottles to oil cans, can be used over and over again and save the need for funnels. They are made of precoated colored metal stock as well as aluminum, and have an adjustable tab section to fit over the container neck.

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⚙️ **PISTOL-GRIP** handle, for the fisherman's casting rod, fits either right or left hand naturally, while an adjustable reel bed allows the reel to be moved to suit the user. Made of aluminum and a plastic, it has a comfortable thumb rest which permits a firm grip on the rod.

Science News Letter, June 18, 1949

⚙️ **NON-MARRING** hammer of an improved type, shown in the picture, has



relatively soft plastic faces, and a hollow metal head between them, which contains a charge of steel grit. As the tip is lowered, the charge follows, practically eliminating recoil of the hammer after it has struck. The plastic tips withstand heavy impact

without cracking or flaking.

Science News Letter, June 18, 1949

⚙️ **MOLDED MATERIAL** for kitchen table-top work surfaces is a special composition permanently bonded to steel that resists wear, is easily cleaned and is uninjured by hot pots moved directly from the range. It is applied to treated steel without glue or adhesive under heavy pressure and high temperature.

Science News Letter, June 18, 1949

⚙️ **GAGE**, to show the height of a liquid in a barrel from which the contents are drawn by means of a faucet near the bottom, is an upright transparent plastic tube set in an elbow between barrel and faucet. The liquid stands as high in the tube as it does in the barrel.

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⚙️ **ELECTRIC SOCKET**, with a bottle-stopper base easily converts almost any bottle, oil lamp or vase into a table lamp. Its stopper, available in three sizes, is constructed of a curved cork strip which can be easily peeled down to make a perfect fit. Connection wire and outlet plug accompany the socket.

Science News Letter, June 18, 1949

Trimethylhexanol is a new but promising industrial alcohol.

Lunar eclipses occur about two-thirds as often as solar eclipses.

Soybean has been pronounced the greatest addition to American staple crops since colonial days.

• Do You Know? •

Agricultural byproducts are used as nutrients for the mold that produces penicillin.

It has taken four years to get Norway's war-destroyed lighthouses and bearing lights back to prewar standards.

Iron carbonyl was used as an anti-knock fluid in motor vehicles in Europe and America during the war, but it fouls spark-plugs and wears engine parts.

In the past 20-year period the number of American farms equipped with electric current has increased from 600,000 to over 4,000,000.

Parking meters are now in use on public tennis courts in one American city; a half-hour playing time costs 25 cents and a red flag "ups" at the end of 30 minutes unless another quarter is deposited.

Carnauba wax from the carnauba palm of Brazil, widely used in polishes in the United States, serves an unusual purpose on its mother tree; it prevents the escape of moisture from within the tree, enabling it to survive severe droughts.

Ocean brine, with salts removed, is a possible source for household water.

Genuine "Panama" hats come from Ecuador, not from Panama as many suppose.

The path of a total eclipse of the sun may be thousands of miles in length but it is only about 65 miles wide.

One power shovel, used by a coal company in stripping the cover of earth over coal veins, has a capacity of 46 cubic yards; in other words, it can move 60 tons of earth in one bite.

The spark plug of an operating automobile sends out electrical impulses strong enough to interfere with television reception when a car passes the antenna unless the broadcasting station is strong enough to overcome them.

Some 3,000 acres of "waste" lands in Kansas, made waste from coal strip-mining operations, now have an excellent cover of bearing black walnut trees, planted some 15 years ago by the former Civil Conservation Corps.

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